On March 6, 2007, I sent the following email to Thomas Chandler, Chief, Disability Rights Office ("DRO")with copies to Cathy Seidel, Chief, CGB; Jay Keithley, Assistant Chief, CGB; and Greg Hlibok, Attorney Advisor, DRO regarding the Interoperability Declaratory Ruling and Further Notice of Proposed Rule Making, specifically addressing the issue of applying the North American Numbering Plan to Internet based relay:

Tom to follow up our discussion earlier this week, I understand Neustar is proposing specifics on the numbering plan per the following:

A deaf person gets a telephone number. A hearing person can call the TN, and the call will automatically be completed to the deaf person with a VRS service. Dialing direct would use the VRS Provider that is preferred by the deaf person. The deaf person can move his number to any other VRS provider. A caller can, if they want, complete the call to the deaf person using any VRS provider they choose, essentially using a dial around. With these mechanisms, the VRS Provider can use existing VoIP "pre-i2" 9-1-1 systems to let deaf people call 9-1-1 and have the call automatically set up with their VRS Provider, with the call arriving at the correct PSAP on the regular 9-1-1 trunks, and with the correct location and call back number.

In detail it would work like this

1. VRS users are assigned telephone numbers (TNs). The telephone numbers come the way that they usually do: either partial blocks of numbers from the local LEC or full NXX's from the numbering administrator are assigned to the VRS Provider who assigns to consumers. This means that a deaf person designates a "default" (or terminating") VRS provider. No one is constrained to use that VRS provider, but if they don't do anything special, that's the one that will be used.

2. There is a database that exists. It's called the "NPAC". It has an entry for every number that has ever been ported (changed carriers) and which carrier currently owns the number. Neustar has the contract to operate this database. Carriers use the database to complete a call to the number. Neustar will make a small enhancement to the database (which has been designed some time ago for other reasons) that allows it to put an Internet "URI" (address) in the database associated with the number. All VRS users will have their TNs in the NPAC, even if they have never moved their number to another VRS provider.

3. Using the NPAC, when a hearing person dials the TN of the deaf person, the call will ring at the terminating VRS provider. The TN appears as ANI (callerid), which automatically lets the VRS provider know who the caller wishes to speak to.

4. The VRS provider maintains a table that maps the TN of the user to his current IP address. When

the VRS user turns his equipment on, it connects to his default VRS provider and supplies his current IP address to put in the table. This happens automatically. The VRS provider uses this table to complete the IP connection to the VRS user. This is a direct dialed call from a hearing person to a deaf person which engages the default VRS provider, and connects automatically.

5. If the calling party (hearing person) wants to use another VRS provider, they call the 800 number of that VRS provider. They supply the TN of the deaf person they wish to call. The (originating) VRS provider consults the NPAC to determine the URI associated with the TN is. That URI can be used across the Internet to reach the table in the terminating VRS Provider that has the IP address. The mechanism that lets the originating VRS Provider call over the Internet to the VRS user through the terminating VRS Provider's table is a standard mechanism used by the VoIP providers. This means the calling party can "dial around" to use his choice of VRS Provider. No resources other than some IP messages are consumed by the terminating VRS provider to permit this.

6. The deaf person can dial a TN to make a call to it. This will engage the terminating VRS provider. The call will complete normally, but the called (hearing) party will see the correct caller id (the TN assigned to the deaf person).

7. The deaf person can make a call through any VRS provider he wants to. When he does callerid may not be correct I am told (and I don't know why this is).

8. The VRS user, when he designates his terminating VRS Provider, supplies his location via registration. This works EXACTLY the same way as it does for a VoIP carrier. You use a web site or a call center to supply your location. You can change it if you want to.

9. The VRS Provider contracts with two specialized service providers. One is called a VoIP Positioning Center (VPC) and the other is called an ESGW (Emergency Services Gateway network). These providers exist, and they provide their services to VoIP carriers. The VRS Provider becomes a customer to the VPC and ESGW operators just like a VoIP carrier does.

10. The VRS user can dial 9-1-1. When he does, an interpreter will be assigned and the call will be routed, over the Internet to the VPC.

11. The VPC looks up the location by the TN of the caller (deaf person). They have a database that can tell them which PSAP should get the call. They also allocate a query key (a form of what in 9-1-1 parlance is called a "p-ANI") to the call.

12. The call is passed to the ESGW network, still an IP call. The ESGW routes the call to the right Selective Router that serves the target PSAP.

13. The PSAP gets the call on its Selective Router trunks, which is how all its other wireline, wireless and VoIP calls arrive. The call has that query key (it's called an ESQK in this case) with it.

14. The PSAP queries its ALI database with the ESQK. The ALI steers the query to the VPC that allocated it.

15. The VPC responds to the query back to the PSAP with the location of the caller, and his real TN. That information shows up on the call taker's screen

16. The call taker has a two way voice path with the interpreter (and the user if voice carryover is deployed).

17. If the caller is disconnected, or the call taker needs to contact the caller later, the TN which was passed in the ALI response can be used to call the deaf person back.

That's what I understand is the call sequence. To implement this, the following needs to happen

1. The NPAC has to be enhanced to store the user's URI. There is a change order in the works in NANC/INC that manages these kinds of things, but it's not approved yet. When it's approved, Neustar will implement the feature. The regular NPAC funding mechanisms will cover this cost.

2. VRS Providers need to enhance the IP part of their service to handle the TN based mechanisms. While what is described is exactly what a VoIP carrier uses, the VRS Providers may not have all the capability today, and may need to develop it. This would be paid as a rate element of the VRS rate as an engineering expense of the various VRS carriers.

3. VRS Providers need to get a block of numbers to give users. They would get them from their underlying carrier of choice if less than an NXX, or they would get a full NXX. The only odd part is that the numbers HAVE to be put in the NPAC, even if they are not ported yet according to Neustar. The FCC may have to authorize VRS providers to obtain full NXXs. I'm not sure whether they currently are entitled to them; I think not..

4. VRS Providers need to contract with VPC and ESGW operators. There are a couple of each available. Most have indicated a willingness to provide identical service to what they provide VoIP carriers at the same cost per month as they charge VoIP carriers, even though the VRS providers have a fraction of the customer base. This is less than $1/mo/subscriber. This either must be paid by the users, or more readily by the interstate fund. VoIP users usually pay this in the form of a surcharge on their bill.

5. VRS Providers must implement the mechanisms to register users and accept location information which should not be a problem.

6. VRS Users must register at the default (terminating) VRS Provider, be assigned a TN, and provide their location.

At that point, the whole thing just works I am told.

The FCC could ask/order NANC/INC to hurry up the change order to put the URI in the NPAC. They could order the VRS providers to provide VoIP equivalent 9-1-1 service exactly the way they ordered the VoIP carriers to do it, since this is almost an identical mechanism to VOIP.

Six months is the time I've been told that Neustar estimates it would take the VRS providers to enhance their systems to do the above. The NPAC update will take less time than that. Nothing else is new.

There are no changes required at PSAPs, there are no changes required in the 9-1-1 network. There are no changes required at the VPCs or the ESGWs. I'm told that not all VRS endpoints (videophones) actually know how to "dial". Software updates for that should not be much of a problem, but it wouldn't really be a big problem to just do what deaf users do now to place calls through VRS, connect and type the number they want.